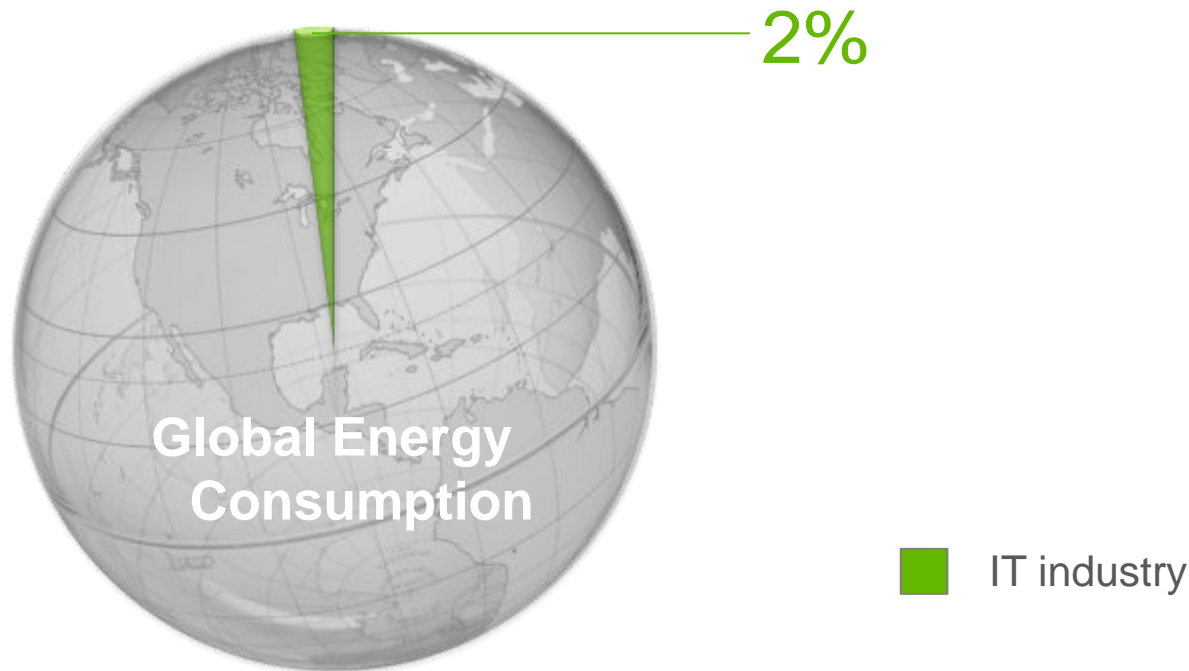# Principles for
Greening Space Systems
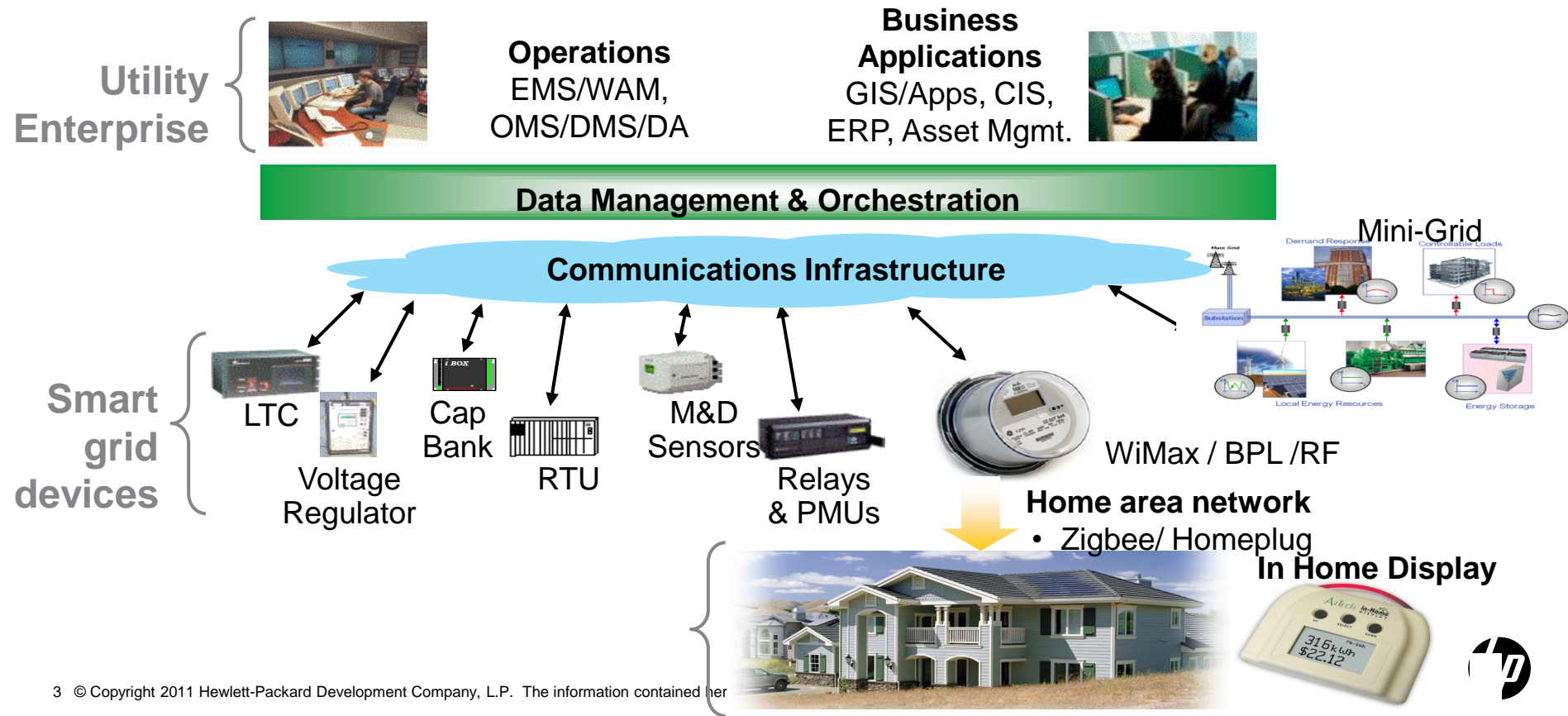
Klaus Hieronymi
Global Resource Efficiency and Circular Economy Strategies, Hewlett-Packard Corporation

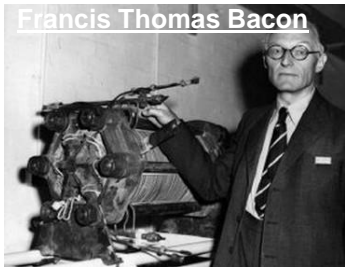The IT Industry is responsible for 2% of the global energy consumption

2%

Global Energy Consumption

IT industry

. . but the IT Industry can help to cut the 98% dramatically

Example on IT Contribution: ‚Smart Grid'

Utility Enterprise

Operations
EMS/WAM,
OMS/DMS/DA

Business Applications
GIS/Apps, CIS,
ERP, Asset Mgmt.

Data Management & Orchestration

Communications Infrastructure

Mini-Grid

Smart grid devices

LTC

Voltage Regulator

Cap Bank

RTU

M&D Sensors

Relays & PMUs

WiMax / BPL /RF

Home area network
• Zigbee/ Homeplug

In Home Display

The Space Industry is a big contributor to sustainebility

1) Major ‚green' Technologies have been developed / optimize by / for the space industry
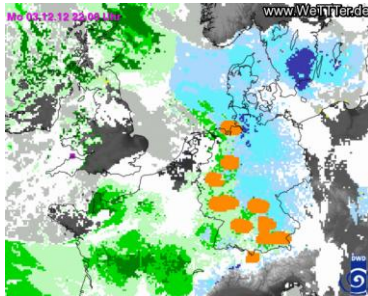

Francis Thomas Bacon

Fuel Cell Bus

The Space Industry is a big contributor to sustainebility

1) Major ‚green' Technologies have been developed / optimize by / for the space industry
   - e.g. Solar Panels, Fuel Cells, light materials

2) Monitoring environmental developments without satelites ?

Smog in China

Smoke from wildfires in Indonesia

The Space Industry is a big contributor to sustainebility

1) Major ‚green‘ Technologies have been developed / optimize by / for the space industry
   - e.g. Solar Panels, Fuel Cells, light materials

2) Monitoring environmental developments without satelites ?

3) Improving processes on earth

Whats in the labs of HP ?

Replacing copper with glass fiber

On boards and processors

➡ **2013:** Servers
Annual savings: 13 TeraWatt-hours of electricity

➡ **2017:** Servers + Chips
Annual savings: 110 TWh of electricity
(Electricity Consumption of Mexico in 2007)

➡ Reduce the need to mine, smelt copper

The space industry and IT .....
a partnership since decades

Lets continue to keep this planet a spacecraft for generations to come

Thank you for your attention !

More information regarding HP and the Environment:

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www.hp.com/recycle
www.iprworks.org